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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

1. This office action, in response to the petition for revival of an application abandoned unintentionally and the request for continued examination filed 10/10/2008, is a final office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/10/2008 has been entered.

3. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Response to Arguments

4. Applicant's arguments filed 10/10/2008 have been fully considered but they are not persuasive. Applicant states a data modulated signal is not the same as the claimed single carrier frequency. The examiner disagrees. The data modulated signal is a signal that is modulated on a carrier. This data modulated signal is multiplied by the output of the frequency hopping synthesizer. The remarks on pages 13-23 are identical to the remarks previously received on 12/12/2007. The response to those remarks is found in the final office action mailed 2/20/2008.

For this reason and the reasons stated in the previous office action, the rejections of the claims are maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 6, 7, 9, 10, 12, 14-19, 33, 34, 36-44, 46, 49, 51, 53, 54, 56, 57, 59, 61-66, 68, 70, 71, 73 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al (US 6,853,629) in view of Fathallah et al (US 6,381,053).

Regarding claims 1, 12 and 14, Alamouti discloses a method of modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems comprising direct sequence/frequency hopping (DS/FH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). The DS-CDMA and FHSS are the protocols combined in the hybrid DS/FH. Alamouti does not disclose the type of frequency hopping used in the DS/FH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow data to overcome noise and interference. Hops occur much more often and less data

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will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH.

Regarding claim 6, the frequency hopping comprises hopping throughout the entire frequency band.

Regarding claim 7, Alamouti discloses a hybrid CDMA system employing direct sequence/frequency hopping/time hopping (DS/FH/TH) (column 2, lines 41-46).

Regarding claims 9 and 10, the combination of Alamouti and Fathallah discloses the method stated above. The combination does not disclose splitting the hybrid signal into two identical components and modulating one of the components wherein the two antennas define an orthogonal polarization. A different embodiment of Alamouti discloses using polarization diversity to enable a base station to efficiently communicate with many remote stations (column 7, lines 28-32). This is possible because the antennas at the base station are designed to distinguish orthogonally polarized signals (column 7, lines 32-38). The antennas are shown in figure 1. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of polarization diversity of the embodiment of Alamouti into the combination of Alamouti and Fathallah.

Regarding claim 15, Alamouti discloses an apparatus for modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems comprising direct

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sequence/frequency hopping (DS/FH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). The DS-CDMA and FHSS are the protocols combined in the hybrid DS/FH. Alamouti does not disclose the type of frequency hopping used in the DS/FH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow data to overcome noise and interference. Hops occur much more often and less data will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH.

Regarding claims 16-19, the combination of Alamouti and Fathallah does not disclose amplifying the transmitted signal. Official notice is taken that the amplification

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of signals prior to transmission is well known in the art of signal transmission. The amplification of signals allows noise in the transmission medium to be overcome and the transmitted signal to be recovered properly at the receiver. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine an amplification circuit with the DS/FH hybrid CDMA system of the combination of Alamouti and Fathallah.

Regarding claims 33, 34, 68, 70 and 71, Alamouti discloses a method of modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems comprising direct sequence/frequency hopping (DS/FH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). The DS-CDMA and FHSS are the protocols combined in the hybrid DS/FH. Alamouti does not disclose the type of frequency hopping used in the DS/FH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every

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information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow data to overcome noise and interference. Hops occur much more often and less data will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH. The combination does not disclose splitting the hybrid signal into two identical components and modulating one of the components wherein the two antennas define an orthogonal polarization. A different embodiment of Alamouti discloses using polarization diversity to enable a base station to efficiently communicate with many remote stations (column 7, lines 28-32). This is possible because the antennas at the base station are designed to distinguish orthogonally polarized signals (column 7, lines 32-38). The antennas are shown in figure 1. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of polarization diversity of the embodiment of Alamouti into the combination of Alamouti and Fathallah.

Regarding claim 36, Alamouti further discloses hybrid CDMA systems that employ direct sequence/frequency hopping/time hopping (DS/FH/TH) in column 2, lines 38-46.

Regarding claims 37, 41-44, 46, 73 and 74, Alamouti discloses an apparatus for modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems

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comprising direct sequence/frequency hopping (DS/FH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). The DS-CDMA and FHSS are the protocols combined in the hybrid DS/FH. The base station of figure 1 discloses splitting the output signal for transmission to the remote users. Alamouti does not disclose the type of frequency hopping used in the DS/FH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow data to overcome noise and interference. Hops occur much more often and less data will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH.

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Regarding claims 38-40, the combination of Alamouti and Fathallah does not disclose amplifying the transmitted signal. Official notice is taken that the amplification of signals prior to transmission is well known in the art of signal transmission. The amplification of signals allows noise in the transmission medium to be overcome and the transmitted signal to be recovered properly at the receiver. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine an amplification circuit with the DS/FH hybrid CDMA system of the combination of Alamouti and Fathallah.

Regarding claims 49, 51, 53, 59 and 61, Alamouti discloses a method of modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems comprising direct sequence/frequency hopping/time hopping (DS/FH/TH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). Alamouti discloses the time hopping CDMA (TH-CDMA) protocol in greater detail in column 2, lines 38-41. The TH-CDMA protocol uses a single, narrow bandwidth, carrier frequency to send bursts of the user's data at intervals determined by the user's unique code (column 2,

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lines 38-41). The DS-CDMA, FHSS and TH-CDMA are the protocols combined in the hybrid DS/FH/TH. Alamouti does not disclose the type of frequency hopping used in the DS/FH/TH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow data to overcome noise and interference. Hops occur much more often and less data will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH/TH.

Regarding claim 54, the frequency hopping comprises hops thought the entire frequency band.

Regarding claims 56 and 57, the combination of Alamouti and Fathallah discloses the method stated above. The combination does not disclose splitting the hybrid signal into two identical components and modulating one of the components wherein the two antennas define an orthogonal polarization. A different embodiment of Alamouti discloses using polarization diversity to enable a base station to efficiently communicate with many remote stations (column 7, lines 28-32). This is possible because the antennas at the base station are designed to distinguish orthogonally

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polarized signals (column 7, lines 32-38). The antennas are shown in figure 1. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of polarization diversity of the embodiment of Alamouti into the combination of Alamouti and Fathallah.

Regarding claims 62-66, Alamouti discloses an apparatus for modulating a carrier frequency of a direct sequence spread spectrum signal by frequency hopping. Column 2, lines 41-46 discloses well known hybrid CDMA systems comprising direct sequence/frequency hopping (DS/FH). Alamouti discloses the DS-CDMA protocol in greater detail in column 2, lines 12-27. DS-CDMA protocol spreads a user's data signal over a wide portion of the frequency spectrum by modulating the data signal with a unique code signal that is of higher bandwidth than the data signal (column 2, lines 12-21). Alamouti discloses the frequency hopping spread spectrum (FHSS) protocol in greater detail in column 2, lines 28-37. The FHSS protocol uses a unique code to change a value of the narrow band carrier frequency for successive bursts of the user's data signal (column 2, lines 28-33). The DS-CDMA and FHSS are the protocols combined in the hybrid DS/FH. Alamouti does not disclose the type of frequency hopping used in the DS/FH hybrid CDMA system. Fathallah discloses types of frequency hopping systems in column 1, lines 31-47. Slow frequency hopping (SFH) means that only one frequency-hop is achieved per bit, however, fast frequency hopping (FFH) means that a number of frequency hops are achieved for every information bit. FFH allows many hops to occur per bit; many more hops than are conducted in slow frequency hopping. The additional hops enhance security and allow

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data to overcome noise and interference. Hops occur much more often and less data will be transmitted on frequencies that are experiencing interference. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the fast frequency hopping protocol of Fathallah into the hybrid CDMA system that employs DS/FH. The combination of Alamouti and Fathallah does not disclose amplifying the transmitted signal. Official notice is taken that the amplification of signals prior to transmission is well known in the art of signal transmission. The amplification of signals allows noise in the transmission medium to be overcome and the transmitted signal to be recovered properly at the receiver. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine an amplification circuit with the DS/FH hybrid CDMA system of the combination of Alamouti and Fathallah.

6. Claims 4, 35 and 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al (US 6,853,629) in view of Fathallah et al (US 6,381,053) further in view of Swanke (US 5,521,533).

Regarding claims 4, 35 and 52, the combination of Alamouti and Fathallah discloses the method stated above in paragraph 5. The combination does not disclose directly synthesizing a digital signal. Swanke discloses the use of direct digital synthesizers in frequency hopping systems (figure 1). The synthesizers receive synchronized frequency hopping control signals from a frequency spread sequencer. The mixer yields a constant resultant frequency output signal of greatly suppressed

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signal distortion during the hopping sequence (column 2, lines 25-31). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the direct digital synthesizer of Swanke into the combination of Alamouti and Fathallah.

7. Claims 8, 55 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al (US 6,853,629) in view of Fathallah et al (US 6,381,053) further in view of Beard (US 7,230,971).

Regarding claims 8, 55 and 72, the combination of Alamouti and Fathallah discloses the method stated above in paragraph 5. The combination does not disclose one or more pseudo random control codes are selected from the group consisting of direct subsets, rolling code segments, scrambling of code vectors and table based reassignments of the bit pattern relationship. Beard discloses a method and apparatus for providing a pseudo random sequence for a spread spectrum system that prevents interception and provides real estate and power consumption efficiency (abstract). Beard discloses a plurality of channels may be associated with a unique and distinct pseudo random sequence and each channel of a frequency band may be associated with a pseudo random sequence. A pseudo random sequence may be retrieved by an apparatus operating in accordance with the present invention through a look-up table and could be utilized to create a hop set for a frequency hopping spread spectrum system (column 3, lines 28-50). The pseudo random codes are table based and assigned and reassigned according to the transmit channel. The use of a table to utilize

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the pseudo random sequences eliminates the need for additional components to carry out computations to derive the sequences since the sequences have already been calculated. This will provides real estate and power efficiency as stated in the abstract. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the method and apparatus for providing a pseudo random sequence of Beard into the method of the combination of Alamouti and Fathallah.

8. Claims 11, 45, 58 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al (US 6,853,629) in view of Fathallah et al (US 6,381,053) further in view of Becker (6,726,099).

Regarding claims 11 and 69, the combination of Alamouti and Fathallah discloses the method stated above in paragraph 5. The combination does not disclose the method comprising transmitting the signal to a radio frequency tag and receiving information from the radio tag. Becker discloses transmitting an RFID tag and receiving information from the tag (figures 1 and 2). It is known to attach RFID tags to articles to be monitored (column 1, lines 41-55). This can be used for security or for inventory management. For these reasons, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the RFID transmission and reception system of Becker into the combination of Alamouti and Fathallah.

Regarding claims 45 and 58, the combination of Alamouti and Fathallah discloses the apparatus stated above in paragraph 3. The combination does not disclose the apparatus comprises a radio frequency tag. Becker discloses transmitting

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an RFID tag and receiving information from the tag (figures 1 and 2). It is known to attach RFID tags to articles to be monitored (column 1, lines 41-55). This can be used for security or for inventory management. For these reasons, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the RFID tag of Becker into the combination of Alamouti and Fathallah.

Conclusion

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/
Primary Examiner, Art Unit 2611
10/21/2008